# VTT Smarthome

Klaus Känsälä, Kalle Määttä

Home environment

- Virtualization of device & interfaces in cloud
- Wireless sensor instrumentation
- Smart lighting control
- Intelligent house appliance control
    - HVAC, user comfort
- 3D User interfaces for monitoring, control and decision making
- Decision making tools for selling/buying energy and managing energy consumption
- Dual power network (24V/240V)

IoT Cloud
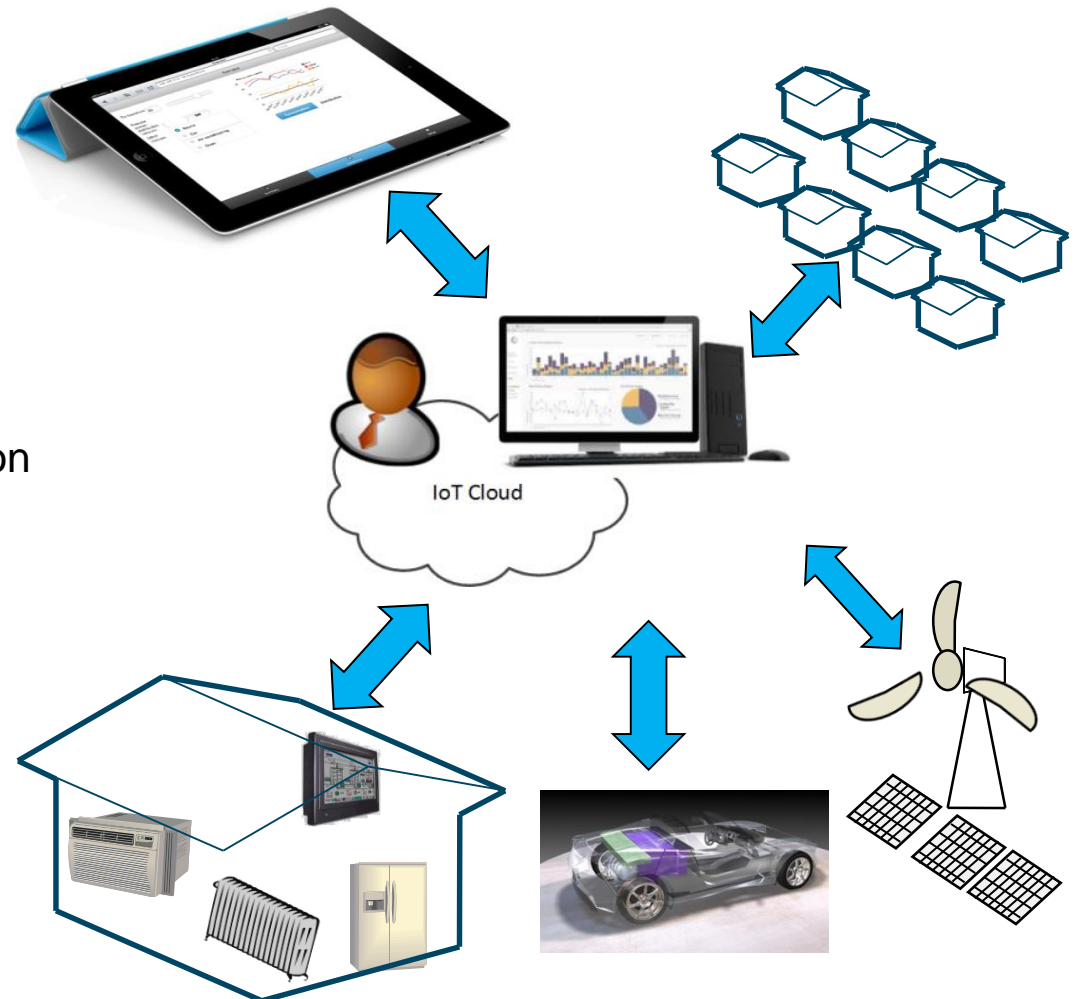
Estate measurements

- ➢ Temperature (wireless, battery powered)
- ➢ Relative humidity (wireless, battery powered)
- ➢ Air pressure (wireless, battery powered)
- ➢ CO2 (wireless, separate sensor)
- ➢ Pressure difference (wireless, separate sensor)

- ▪ The sensors can be assembled to a building with a gateway unit. The unit will collect and send all data to a cloud server which can be proprietary for the client
- ▪ Sensor units are using BT low energy for communication, Gateway is using WLAN or operator based network (LTE) for communication to the cloud server
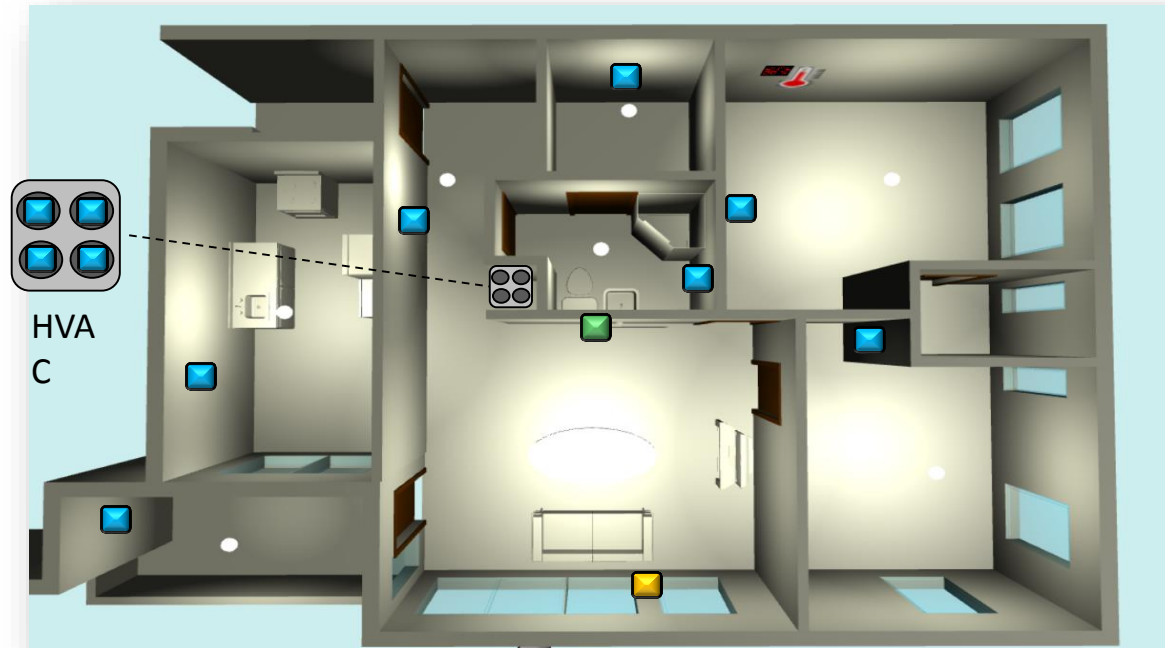
Building measurement instrumentation

THP -Sensor

THPCO2 -Sensor

THPd -Sensor

- Integrating sensor data model with facilities data model, obtaining and storing sensor values from different systems
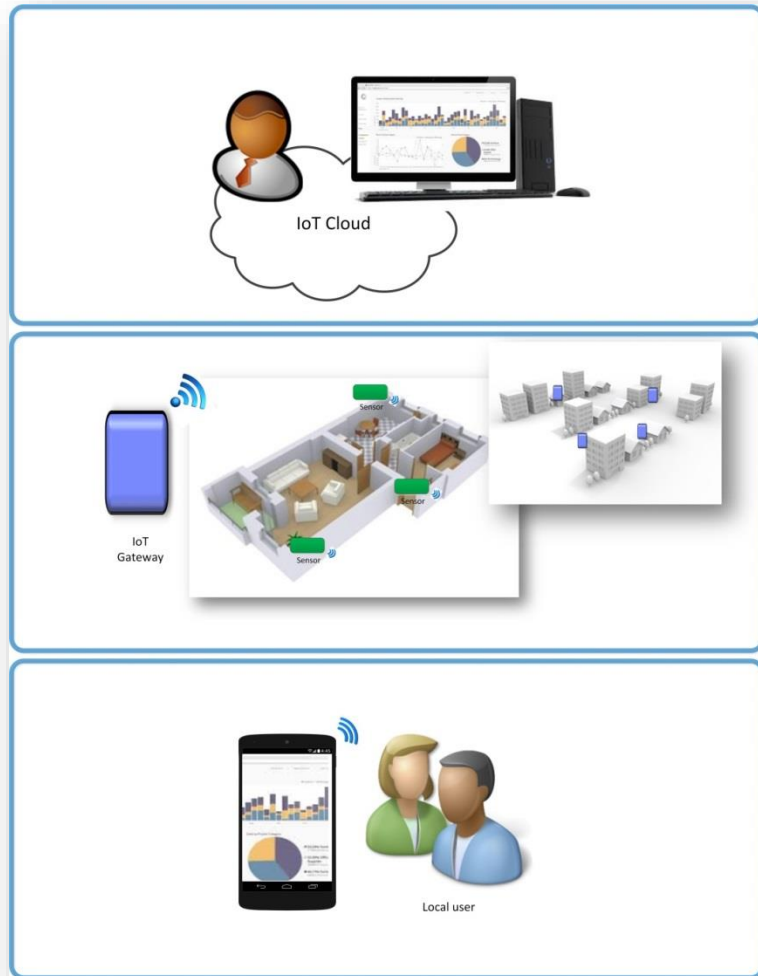
HVAC

= T, H, P Temperature, Humidity and Pressure sensor
= T, H, P, CO2, Temperature, Humidity, pressure and CO2
= T, H, Pd, Temperature, Humidity and Pressure difference

Appliance monitoring and control concept

- Backend Solutions
  - Integration to building energy management
  - Cloud computing capabilities
  - Data fusion (e.g weather, electricity stock)
- Service concepts
  - Building service systems
  - Maintenance and control
  - Alarm services
- IoT Sensor Networks
  - Indoor space monitoring
  - Environment sensing
  - Data fusion
  - Distributed computing
- Local Services
  - Monitoring and visualization
  - Maintenance
  - System management

Additional information

VTT Technical Research Centre of Finland Ltd

Klaus Känsälä
Senior Scientist
Industrial IoT
+358405460131
klaus.kansala@vtt.fi

TECHNOLOGY FOR BUSINESS